

CHAPTER III

RESEARCH METHOD

A. Design of the Research

This research is experimental research that uses pre-experimental research. Pre-experiment is research used to determine the effect of a particular treatment. This research uses a one-group pretest-posttest design to find out whether the cake application can increase students' vocabulary. This design uses one class that receives experimental class treatment using the cake application. In this study, the pretest (O1) was given before the researcher taught the cake application with the aim of measuring students' vocabulary knowledge before the treatment was carried out. Then the treatment was given three times by teaching them to use the cake application to increase students' vocabulary. Posttest (O2) was given after teaching with the cake application to measure the extent to which students' vocabulary increased after receiving treatment.

Pre-test is a form of question to determine students' initial knowledge. Post-test is the final evaluation with the aim of finding out whether students have understood or not after applying a method or technique. According to Sugiyono (2016), research design can be represented as follows:

Table 3.1
The Research Design

Group	Pre-test	Treatment	Post-test
A	O ₁	X	O ₂

Explanation:

A :Experimental Group

O₁ :Pre-test

X :Treatment

O₂ :Post-test

B. Population and Sample of the Research

1. Population

A population is a group of individuals who have the same characteristics (Creswell, 2008). So, a population is all individuals who have certain characteristics and are of interest to researchers. The population in this study were all class VII students of SMPN 1 juhan for the 2023/2024 academic year. The total population is 60 students divided into three classes (VII-A, VII-B, VII-C), each class consisting of 20 students.

Table 3.2
Population of the Research

Class	Number of the Students'
VII-A	20
VII-B	20
VII-C	20

Table 3.2 above shows that the number of class VII A students is 20 people. At SMPN 1 Jujuhan, 20 students in class VII B, 20 students in class VII C, 20 students.

2. Sample

The sample is part of the object to be studied which represents the population that is able to describe the population optimally. Syofian (2013) state that sample is a data collection procedure where only a portion of the population is taken and used to determine the desired characteristics and characteristics of a population. In determining the sample there are several techniques in sampling.

Based on the population size above, it is large enough to be used as a research sample. The sample is homogeneous so it uses the Cluster Random Sampling Technique to select one of the classes that will be used as a sample. The cluster sampling technique is the process of randomly selecting entire groups, not individuals in a population determined to have

the same characteristics. The cluster sampling technique is used to determine the sample that will be the research subject.

from the three existing classes, several classes were randomly selected to be used as research samples. This process is carried out to ensure that each cluster has an equal chance of being selected, thereby reducing bias in sample selection. Through this method, class VII C was selected and designated as the research sample, totaling 20 students.

C. Technique for Collecting Data

1. Pre-test.

Researchers gave initial tests to students before providing treatment. The form of the test is multiple choice. There are twenty five numbers in each test. Researchers distributed tests to identify students' vocabulary mastery. So, students have to take the test.

2. Treatment

Researchers gave treatment to students after conducting a pre-test. Researchers teach students how to increase vocabulary using the Cake application. The following are some learning process procedures:

- a. At the time before starting to provide subject matter, the researcher conveyed some motivation and reminded the students about how importance it is to learn English.
- b. The researcher provided insight into the learning process.

- c. The researcher asked the students to introduce themselves in front of the class.
- d. The researcher explained the intent or purpose of research.
- e. The researcher introduced and showed the Cake Application, then explained the functions, features and how to use the Cake Application to students.
- f. The students started to practice and explored cake applications.
- g. Ask students to look for the Q (Quiz) feature and complete the contents of the Quiz with the vocabulary keywords below.
- h. Students are asked to come forward in front of the class and fill in the blanks in the Quiz feature with the answers that have been filled in previously.

3. Post Test

After providing treatment, finally the researcher gave a post-test. The post-test contains twenty five numbers in multiple choice form. The researcher gave each number one minute, so students had twenty five minutes to take the test. Provide a post-test to determine the results of applying the cake application in the treatment.

4. Instrument

The instrument in this study was a test. A research instrument is a tool used by researchers to collect the data needed for a study. According to Arikunto (2010), a research instrument is a tool or facility used by researchers to collect data to facilitate their work and produce

better results, meaning more accurate, complete, and systematic. Therefore, the instrument must be designed in accordance with the research objectives and the characteristics of the variables being studied.

In this study, the instrument was used to measure the vocabulary mastery of seventh-grade students at SMPN 1 Jujuhan, MuaroBungo Regency, after being treated using the cake application. Therefore, the instrument used must be able to accurately reflect the students' level of vocabulary mastery.

The research instruments used in this study consisted of a written test. According to Brown (2004), a written test requires students to provide written responses, either in the form of multiple-choice or short-answer questions, and can be used to measure various aspects of language ability, including vocabulary mastery.

Written tests can be presented in various formats, such as multiple-choice, matching, short answer, true-false, or essay questions. Each test format has its own characteristics in measuring students' vocabulary comprehension. In this study, the researchers used a written test in the form of multiple-choice questions because this test format is considered capable of objectively measuring students' vocabulary mastery and facilitates the scoring process and data analysis.

The multiple-choice test used in this study initially consisted of fourty questions, structured based on indicators of vocabulary mastery

for 1seventh-grade students. These questions covered understanding word meaning, vocabulary use in sentence contexts, and the ability to choose appropriate words in specific contexts.

Before being used as a research instrument, the test was first piloted with students to determine the level of item validity. The trial was conducted once, directly with students. Based on the validity test results, twenty six questions were found to be valid and fourteen were declared invalid. From these valid questions, the researchers then selected twenty five questions to be used as the test instrument in this study. The selection of questions was made based on their suitability to the research indicators and a balanced level of difficulty.

Table 3.3 validity of the questions

Question number	Sig value	Information
Question 1	0.206	Invalid
Question 2	0.024	Valid
Question 3	0.023	Valid
Question 4	0.078	Valid
Question 5	0.002	Valid
Question 6	0.050	Valid
Question 7	0.002	Valid
Question 8	0.499	Invalid
Question 9	0.301	Invalid
Question 10	0.005	Valid
Question 11	0.005	Valid
Question 12	0.002	Valid
Question 13	0.005	Valid
Question 14	0.025	Valid
Question 15	0.328	Invalid
Question 16	0.081	Valid
Question 17	0.533	Invalid
Question 18	0.025	Valid
Question 19	0.584	Invalid
Question 20	0.499	Invalid
Question 21	0.002	Valid
Question 22	0.019	Valid

Question 23	0.078	Valid
Question 24	0.006	Valid
Question 25	0.025	Valid
Question 26	0.333	Invalid
Question 27	0.001	Valid
Question 28	0.206	Invalid
Question 29	0.717	Invalid
Question 30	0.851	Invalid
Question 31	0.002	Valid
Question 32	0.002	Valid
Question 33	0.202	Invalid
Question 34	0.005	Valid
Question 35	0.005	Valid
Question 36	0.879	Invalid
Question 37	0.008	Valid
Question 38	0.001	Valid
Question 39	0.333	Invalid
Question 40	0.001	Valid

Table 3.3 shows the results of the validity test of the research instrument. The validity of the items was determined by analyzing their significance values using a commonly accepted criterion. Items with significance values that met the required standard were considered valid, while those that did not meet the standard were categorized as invalid. The results indicate that most of the items were valid and appropriate for measuring the variables of this study. Nevertheless, several items did not meet the validity requirements, indicating that they were less suitable for measuring the intended construct. Therefore, only the valid items were used in the data collection process, while the invalid items were removed or revised in order to improve the quality of the research instrument.

D. Technique for Data Analysis

Before analyzing the data, the researcher collected the data and analyzes them by using the following procedures:

1. Analyzing the raw data of the pre-test. Each of the students' correct answers got 1 and the wrong answer got 0.
2. Raw scores were converted to a set of core maximum of 100, using the following formula:

$$\text{Score} = \frac{\text{total correct answer}}{\text{total test item}} \times 100$$

3. Converting the score of the students into values
4. Score or the test is classified in criteria as follows:
 - a. 90 to 100 is classified as excellent
 - b. 80 to 89 is classified as very good
 - c. 70 to 79 is classified as good
 - d. 60 to 69 is classified as average
 - e. 50 to 59 is classified as fair
 - f. 40 to 49 is classified as poor
 - g. 0 to 39 is classified as very poor.

Data analysis is the process of systematically applying statistical techniques to describe and illustrate, condense and recap, and evaluate data. The following is the data analysis of this research:

1. DescriptiveDataAnalysis

Descriptive analysis is a statistical analysis used to describe the data that will be used in research to make conclusions that apply generally. The results of this descriptive data analysis are a summary of the samples to be processed, such as average, middle value, mode, etc.

a. Mean

The mean is a representative of a data set or an average value which is considered to be the value closest to the actual measurement results. Determining the mean can be done by adding up all the data values, then dividing it by the number of data. For more details to determine the mean can use the following formula:

$$M_x = \frac{\sum X}{N}$$

Where:

M_x = Mean (average value)

$\sum X$ = The sum of all observed data values

N = The total number of observations

b. Standart Deviation

Standard deviation is the distribution of data in a sample to see how far or how close the data values are to the average. One of the functions of the standard deviation formula is to provide an overview of the distribution of data relative to the average. To determine the deviation data can use the following formula:

$$SD = \sqrt{\frac{\sum x^2}{N}}$$

Where:

SD = Standard Deviation

$\sum x^2$ = The sum of the squared deviations of each data value from the mean

N = The total number of observations

c. MAX

The MAX function is used to display the maximum (largest) value or number contained in a data cell/range.

d. MIN

The MIN function is the opposite of MAX where MIN is used to display the minimum (smallest) value or number contained in a cell/range.

2. Normality Test

Normality test aims to determine the distribution of data. Data normality is important, because with normally distributed data, the data are considered to represent the population (Purnomo, 2016). The normality test was carried out using the Kolmogrov-Smirnov test using SPSS 29 software. The data are categorized as normal if the significance obtained is greater

than 0.05 (Prayitno, 2010). Significance is a term in statistics as a reference to determine the effect of treatment on the research object.

3. Homogeneity Test

The homogeneity test aims to determine whether the variance is homogeneous or not in the two data groups. This test can be carried out using the Levene test using SPSS 29 software, so that a significance value is obtained. Data is categorized as normal if the significance is greater than 0.05 (Priyatno, 2010).

4. Hypothesis Test

The hypothesis test is carried out after carrying out the normality test and homogeneity test. The hypothesis test aims to find out whether or not there are differences in the competencies that have been assessed between the pretest and posttest. Hypothesis testing using the independent Samples T Test using SPSS 29 The criteria for testing the hypothesis are as follows (Priyatno, 2010)

- a. H_0 is accepted (H_1 rejected) if the significance value is > 0.05 Hypothesis accepted.
- b. H_0 is rejected (H_1 accepted) if the significance value is < 0.05 .